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This is to certify that the attached English language document, identified as Patent Application Publication No. Heisei 10-306912 "Soot Blower Device", is a true and accurate translation of the original Japanese language document to the best of our knowledge and belief.

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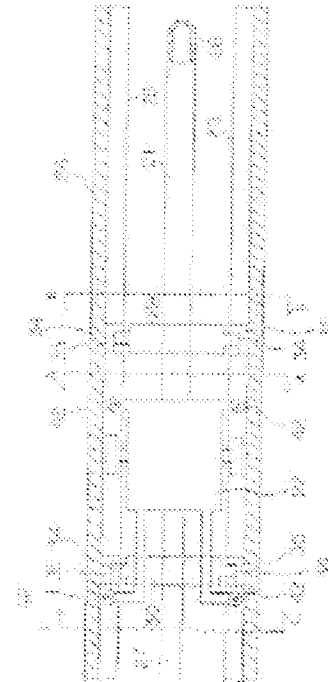
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(54) [Title] Soot Blower Device

(57) [Abstract]

[Problem] The object is to provide a soot blower device permitting a support member of simple and compact structure supporting a lance tube and a feed tube.

[Solution] [The invention is] characterized in that a pair of tube supports 29 and 30 are provided in front of and to the rear of a traveling carriage 22 in a manner permitting back and forth movement, and a stopper mechanism member 35, restricting the movement of tube supports 29 and 30, is provided on a running base 24.



[Claims]

[Claim 1] A soot blower device, equipped with a lance tube having a dust-removing medium blow hole on the front end portion thereof, a traveling carriage causing said lance tube to advance and retract to the front and to the rear, and a running base supporting said traveling carriage in a manner permitting movement to the front and to the rear;

characterized in that a pair of tube supports are provided in front of and to the rear of said traveling carriage in a manner permitting back and forth movement, and a stopper mechanism member, restricting movement of said tube supports, is provided on said running base.

[Detailed Description of the Invention]

[0001]

[Technical Field of the Invention] The present invention relates to a soot blower device employed in the course of removing soot and the like that has adhered to the heat exchange tubes in a heat exchange device such as a boiler.

[0002]

[Prior Art] A conventional soot blower device is shown in Figs. 7 to 9. In Fig. 7, numeral 1 denotes a lance tube inserting into a boiler through a through-hole 3 provided in the outer casing 2 of the boiler. A traveling carriage 4 for causing lance tube 1 to advance and retract to the front and rear is provided at the rear end portion of lance tube 1. A pair of right and left rollers 5 and 5 (see Fig. 9) are present on the two sides of traveling carriage 4. Rollers 5 and 5 are supported between a pair of right and left upper roller guides 7 and 7 and lower roller guides 8 and 8 provided on a running base 6. Lance tube 1 is held in rotatable fashion by traveling carriage 4 through bearings, not shown, and a rotation-driving device (not shown), driving rotation of lance tube 1, is provided within traveling carriage 4.

[0003] A feed tube 9 supplying a dust-removing medium such as steam to the interior of lance tube 1, is provided inside traveling carriage 4. The front end portion of feed tube 9 is inserted in retractable fashion into lance tube 1, and a dust-removing medium blow hole 10, for blowing a dust-removing medium such as steam out to the exterior, is provided in the front end portion of lance tube 1. A seal member (not shown) provided on the rear end portion of traveling carriage 4 is inserted in freely sliding fashion into the rear end portion of feed tube 9 and is connected to a head valve 11.

[0004] When removing soot that has adhered to the heat exchange tube of a boiler with such a soot blower device, traveling carriage 4 is moved forward to insert lance tube 1 into the boiler. Next, in this state, lance tube 1 is driven to rotate by a rotation driving device, not shown. When dust-removing medium is fed into lance tube 1 from feed tube 9, the dust-removing medium that has been fed into lance tube 1 is blown out through dust-removing medium blow hole 10, removing soot that has adhered to heat exchange tubes.

[0005] In such a soot blower device, lance tube 1 and feed tube 9 become long when the boiler is large. When lance tube 1 and feed tube 9 become long, they also become highly flexible. When the flexibility of lance tube 1 and feed tube 9 increases, an excessive load is exerted on the bearing member supporting the rear portion of lance tube 1 and on the seal member provided in the rear end portion of traveling carriage 4, running the risk of damaging the above-described bearing member and seal member. Accordingly, to prevent such problems, roller supports 12 (see Fig. 8) have conventionally been provided

in front of and behind traveling carriage 4. Roller supports 12 and 12 support lance tube 1 and feed tube 9 from beneath, preventing damage to the bearing member and the seal member.

[0006]

[Problem to Be Solved by the Invention] However, in such a conventional soot blower device, to prevent interference between traveling carriage 4 and roller supports 12, roller supports 12 are mounted on shafts 13. The two ends of shafts 13 must be supported in rotatable fashion by bearings 14 on running base 6. Further, members 15 and 15, mounted on shafts 13 and 13 must be linked by a link 16 so that when one of roller supports 12 is pushed down, the other roller support 12 rises. Thus, there are problems in that the structure of the support member supporting lance tube 1 and feed tube 9 becomes complex, and traveling carriage 4 increases in size.

[0007] The present invention, devised in light of the above-described problems, has for its object to provide a soot blower device in which the support member supporting the lance tube and feed tube is of a simple and compact structure.

[0008]

[Means of Solving the Problem] To attain the above-stated object, the present invention is a soot blower device, equipped with a lance tube having a dust-removing medium blow hole on the front end portion thereof, a traveling carriage causing said lance tube to advance and retract to the front and to the rear, and a running base supporting said traveling carriage in a manner permitting movement to the front and to the rear; characterized in that a pair of tube supports are provided in front of and to the rear of said traveling carriage in a manner permitting back and forth movement, and a stopper mechanism member, restricting movement of said tube supports, is provided on said running base.

[0009]

[Mode of Implementing the Invention] A mode of implementing the present invention will be described below with reference to the drawings. Figs. 1 to 6 show an implementation mode of the present invention. Fig. 1 is a top view of a soot blower device relating to the implementation mode. Fig. 2 is a sectional view along section line A-A in Fig. 1. Fig. 3 is a sectional view along section line B-B in Fig. 1. Fig. 4 is a

sectional view along section line C-C in Fig. 1. In Fig. 1, 21 denotes a lance tube inserting into a boiler through a through-hole provided in the outer casing of the boiler. A traveling carriage 22 is provided at the rear end portion of lance tube 21 for advancing and retracting lance tube 21 forward and to the rear.

[0010] Traveling carriage 22 comprises a pair of rollers 23 and 23 on the right and left sides (see Fig. 2). Rollers 23 and 23 are supported between a pair of right and left upper roller guides 25 and 25 and a pair of lower roller guides 26 and 26 provided on a running base 24. Lance tube 21 is held in rotatable fashion on traveling carriage 22 through bearings. A rotation driving mechanism (not shown) driving rotation of lance tube 21 is provided within traveling carriage 22.

[0011] A feed tube 27 feeding a dust-removing medium such as steam into lance tube 21 is provided within traveling carriage 22. The front end portion of feed tube 27 is inserted in retractable fashion into lance tube 21, and a dust-removing medium blow hole 28 for blowing dust-removing medium such as steam out to the exterior is provided in the front end portion of lance tube 21. The rear end portion of feed tube 27 passes through a seal member provided in the rear end portion of traveling carriage 22, connecting to a head valve, not shown.

[0012] A pair of tube supports 29 and 30, supporting lance tube 21 and feed tube 27, are provided to the front and rear of traveling carriage 22. As shown in Figs. 3 and 4, tube supports 29 and 30 are equipped with support rollers 31 supporting lance tube 21 or feed tube 27 from beneath, and a support plate 32, supporting support rollers 31. On the right and left side portions of support plate 32 are mounted a pair of rollers 33 and 33. Rollers 33 support support plate 32 in a manner permitting movement to the front and rear, and are supported between upper roller guide 25 and lower roller guide 26 of running base 24.

[0013] A pair of right and left stopper members 34 and 34 are provided in the upper and lower portions of support plate 32 so as to protrude from the right and left sides of support plate 32. Stopper members 34 function in concert with a pair of right and left stopper mechanism members 35 provided on running base 24 to restrict movement of support plate 32. Stopper mechanism members 35 are positioned to the front and rear of traveling carriage 22.

[0014] Fig. 5 is a top view of stopper mechanism member 35 provided on running base 24. Stopper mechanism member 35 will be described below with reference to Fig. 5. As indicated in Fig. 5, stopper mechanism member 35 is equipped with a base plate 36 secured to running base 24. A stopper block 37 is positioned on the upper surface of base plate 36 so as to come into contact with stopper member 34. A shaft 38 is provided in rotatable fashion on the upper surface of base plate 36. On the lower portion of shaft 38 is mounted a stopper arm 39, securing stopper member 34 between it and stopper block 37. On the upper portion of shaft 38 is mounted a stopper release arm 40. Stopper release arm 40 is for releasing the restriction of movement by stopper arm 39; a stopper release member 42, provided on traveling carriage 22, engages in a slit member 41 formed in the front end portion of stopper release arm 40.

[0015] When removing soot that has adhered to the heat exchange tubes within a boiler with such a soot blower device, traveling carriage 22 is moved forward to insert lance tube 21 into the boiler. A dust-removing medium such as steam is blown out through the dust-removing medium blow hole 28 provided in the front end portion of lance tube 21 to remove soot. When traveling carriage 22 moves forward, stopper release member 42 provided on traveling carriage 22 engages in slit member 41 formed in stopper release arm 40. When traveling carriage 22 is moved further forward in this state, as shown in Fig. 6, stopper release arm 40 and stopper arm 39 rotate along with shaft 38 in a counterclockwise direction as viewed in the figure. This releases the movement restriction on support plate 32, and tube supports 29 and 30, supporting lance tube 21 and feed tube 27, move forward along with traveling carriage 22. Further, when retracting lance tube 21 from inside the boiler, traveling carriage 22 is withdrawn to a prescribed position. When traveling carriage 22 is withdrawn, stopper member 34 provided on support plate 32 comes into contact with stopper block 37 of stopper mechanism member 35 and stopper release member 42 provided on traveling carriage 22 engages in slit member 41 formed in stopper release arm 40. When traveling carriage 22 withdraws in this state, stopper release arm 40 and stopper arm 39 rotate along with shaft 38 in a clockwise direction as viewed in the figure. This restricts the movement of support plate 32, stopping tube supports 29 and 30, supporting lance tube 21 and feed tube 27, at prescribed positions.

[0016] In the implementation mode shown in Figs. 1 to 6, by providing a pair of support plates 32 and 32 to the front and rear of traveling carriage 22 in a manner permitting movement to the front and rear, and mounting support rollers 31, supporting lance tube 21 and feed tube 27, on support plates 32 and 32, support rollers 31 and 31 are prevented from interfering with traveling carriage 22 when traveling carriage 22 moves to the front and rear. Accordingly, tube supports 29 and 30 supporting lance tube 21 and feed tube 27 can be simple and compact in structure, permitting reduction in the size of the soot blower device.

[0017]

[Effect of the Invention] In the present invention as set forth above, a pair of support plates are provided to the front and rear of a traveling carriage in a manner permitting movement to the front and rear, and support rollers supporting a lance tube and a feed tube are mounted on the support plates. Thus, the support rollers do not interfere with the traveling carriage as it moves to the front and rear, permitting support members that are simple and compact in structure for supporting the lance tube and feed tube.

[Brief Description of the Drawings]

[Fig. 1] A drawing showing the schematic configuration of a soot blower device in an implementation mode of the present invention.

[Fig. 2] A sectional view along section line A-A in Fig. 1.

[Fig. 3] A sectional view along section line B-B in Fig. 1.

[Fig. 4] A sectional view along section line C-C in Fig. 1.

[Fig. 5] A top view of the stopper mechanism member shown in Fig. 1.

[Fig. 6] A drawing descriptive of the operation of the stopper mechanism member.

[Fig. 7] A drawing showing the schematic configuration of a conventional soot blower device.

[Fig. 8] A drawing descriptive of the structure of the support member supporting the lance tube and feed tube in a soot blower device.

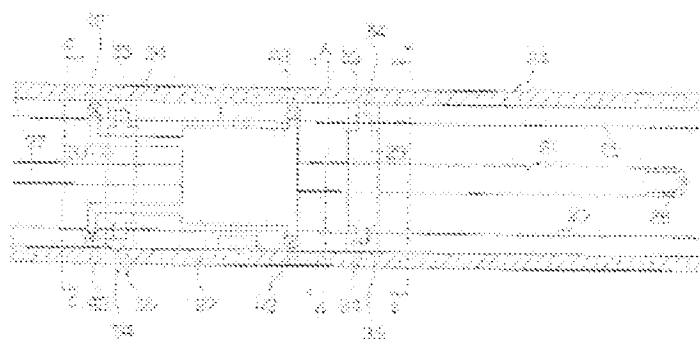
[Fig. 9] A sectional view along section line D-D in Fig. 8.

[Key to the Numbers]

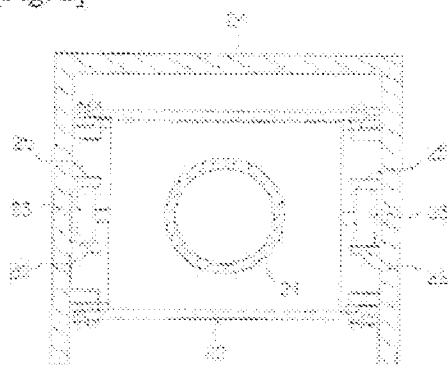
- 21 Lance tube
- 22 Traveling carriage

- 24 Running base
- 27 Feed tube
- 28 Dust-removing medium blow hole
- 29, 30 Tube supports
- 31 Support roller
- 32 Support plate
- 33 Roller
- 34 Stopper member
- 35 Stopper mechanism member
- 42 Stopper release member

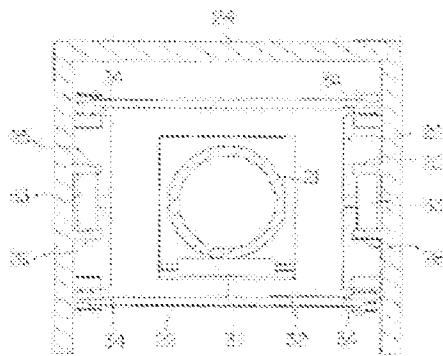
[Fig. 1]



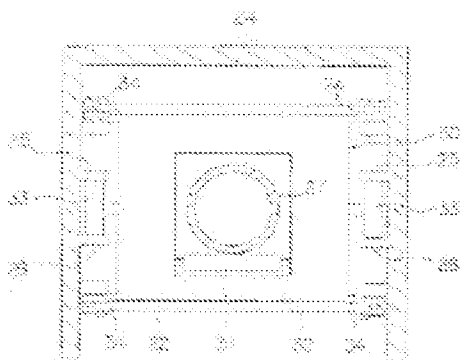
[Fig. 2]



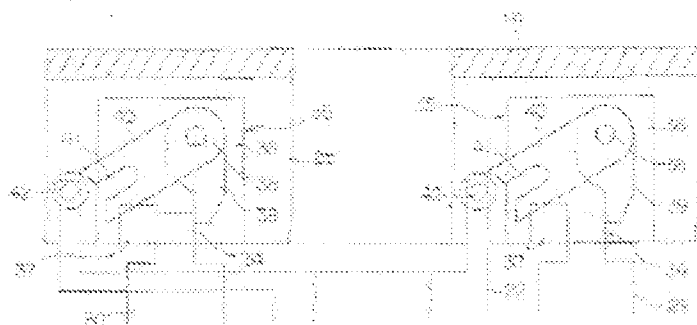
[Fig. 3]



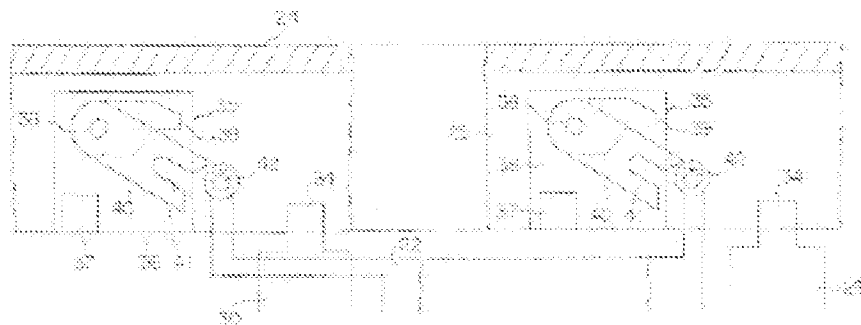
[Fig. 4]



[Fig. 5]



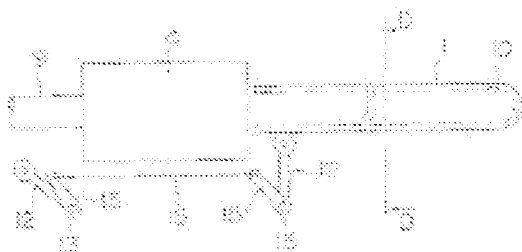
[Fig. 6]



[Fig. 7]



[Fig. 8]



[Fig. 9]

